STACK SAMPLE SYSTEM INSTALLATION AND REMOVAL

Purpose

This Air Quality Group procedure describes the steps to determine whether a sample system should be installed or removed from a point source.

Scope

This procedure applies to any point source of radioactive materials.

In this procedure

This procedure addresses the following major topics:

Topic	See Page
General Information About This Procedure	2
Who Requires Training To This Procedure?	2
Background	4
Tier II sources	5
Tier III sources	7
Tier IV sources	11
Deciding disposition of sampling system	12
Documenting Your Work	13
Records Resulting From This Procedure	14

Hazard Control Plan

The hazard evaluation associated with this work is documented in HCP-ESH-17-Office Work.

Signatures

Prepared by: Scott Miller, R&LS Team Leader	Date: 12/7/00
Approved by: Dave Fuehne, Rad-NESHAP Project Leader	Date: 12/18/2000
Approved by: Terry Morgan, Quality Assurance Officer	Date: 12/19/00
Approved by: Doug Stavert, ESH-17 Group Leader	Date: 12/18/00

01/29/01

General information about this procedure

Attachments

This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Determining Sampler/Monitor Type	1
2	Documentation Requirements for Tier III sources	1

History of revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description of Changes
0	1/4/01	New document.

Who requires training to this procedure?

The following personnel require training before implementing this procedure:

- ESH-17 personnel assigned to perform all or part of this procedure.

Training method

The training method for this procedure is "**self-study**" (**reading**) and is documented in accordance with the procedure for training (ESH-17-024).

Prerequisites

None.

General information, continued

Definitions specific to this procedure

Potential Effective Dose Equivalent (PEDE): The effective dose equivalent that is calculated "to any member of the public at any offsite point where there is a residence, school, business or office" (40 CFR 61.94.a). This dose is calculated using CAP88 and assumes that "all pollution control equipment [does] not exist, but the facility operations were otherwise normal" (40 CFR 61.93.b.4.ii).

Point source: A source of air emissions that meets the following criteria:

1. The release point must be stationary,

AND

2. the effluent discharged from the operation or building must be "actively exhausted through a forced ventilation system via a single point" (FFCA),

AND

3. the operation must have the potential to emit radionuclides "based on the discharge of the effluent stream that would result if all pollution control equipment did not exist, but the facilities operations were otherwise normal" (40 CFR 61.93.b.4.ii).

Tier classification: Graded approach to sampling and documentation requirements.

References

The following documents are referenced in this procedure:

- ESH-17-024, "Personnel Training"
- National Emission Standards for Hazardous Air Pollutants, 40 CFR 61
- Current Radioactive Materials Usage Survey for Point Sources
- ESH-102, "Radioactive Materials Usage Survey For Point Sources"
- ESH-17-126, "Performing a Radionuclide Point Source Air Emissions Inventory Interview"
- ESH-17-137, "Evaluating Potential Emissions And Potential Effective Dose Equivalent From Point Sources"
- ESH-17-RN, "QA Project Plan for the Rad-NESHAP Compliance Project"

Note

Actions specified within this procedure, unless preceded with "should" or "may," are to be considered mandatory guidance (i.e., "shall").

Background

Background

Each point source at the Laboratory is classified as either Tier II, III, or IV, in accordance with the requirements and schedule set forth in ESH-17-RN.

Since only Tier II sources require sampling to demonstrate compliance with 40 CFR 61, Subpart H, the Project leader must decide the ultimate disposition for sample systems that are in place on Tier III or Tier IV sources. Additionally, because some sampled sources may lose their status as point sources (e.g., source term is removed), the project leader must also decide the ultimate disposition for such sample systems.

Historically, the Rad-NESHAP Project has de-energized and removed sample systems that were no longer needed. This, however, prevents the use of these systems for periodic confirmatory measurements. Therefore, this practice is no longer considered appropriate unless overriding factors (e.g., funding, access) necessitate it.

Tier II sources

Overview

ESH-17-RN establishes a graded approach to stack sampling and documentation requirements. Under this approach, any source with the potential to contribute greater than 0.1 mrem/yr in any year is considered a Tier II source. Per 40 CFR 61.93, these sources must be sampled for the emissions of radioactive materials.

Identifying the correct sample system

Each Tier II source must be sampled for any radioactive material that has the potential to contribute greater than 0.01 mrem/yr or greater than 10% of the PEDE. To ensure this is so, perform the following steps for each point source.

NOTE: This approach to sampling is somewhat more stringent than specified in Subpart H. As written in Subpart H, only those radionuclides that contribute greater than 10% to the overall PEDE must be sampled. Under this language, the activated gases at LANSCE would not require monitoring. This is because they have relatively small potential emissions as compared to particulate emissions. The proposed application of the monitoring requirement not only meets the letter of the law, but also the intent.

Step	Action
1	Determine the potential effective dose equivalent of each radionuclide potentially emitted from the source. This is calculated in accordance with ESH-17-137.
2	Record the stack number and other relevant information on the Determining Sampler/Monitor Type (Attachment 1).
3	Identify any radionuclide that contributes greater than 10% of the PEDE. Record these radionuclides and their relative percentages in Table 1 of Attachment 1 to this procedure.
4	Sum the percentage contribution to PEDE for each of these 10% radionuclides identified in step 2. Record this total in Table 1. If… / Then.. Sum ≥ 90% / Go to step 7. Sum < 90% / Go to step 5.
5	Sort remaining radionuclides by contribution to overall dose (e.g., percentage).
6	Select the highest percentage radionuclides and record in table 2. Continue until the sum of these radionuclides added to the sum from Table 1 is ≥ 90%.

Steps continued on next page.

Tier II sources, continued

Step	Action
7	Identify any remaining radionuclides that contribute greater than 0.01 mrem/yr to the PEDE. Record these radionuclides in table 3.
8	For all radionuclides recorded in Tables 1, 2, or 3, identify in the third column of each table the type of sampling system required: tritium bubbler for HT or HTO, paper filter for particulates, real-time for activated gases, or charcoal cartridge for vapor-form radionuclides such as iodine.
9	Sign and date the form as preparer.
10	Have a technical reviewer peer review the form and sign and date.
11	After all review comments have been addressed, forward to the project leader for approval.

Tier III sources

Overview

ESH-17-RN establishes a graded approach to stack sampling and documentation requirements. Under this approach, any source with the potential to contribute greater than 0.001 mrem/yr in any year, but less than 0.1 mrem/yr, is considered a Tier III source. Per 40 CFR 61.93, these sources do not require continuous sampling.

Under the requirements of ESH-17-RN, however, documentation of estimated emissions must be traceable to a secondary source of data (e.g., stack sampling).

Currently sampled Tier III sources

If a source is Tier III and is currently sampled, the decision must be made to leave the sampling system in place or to disable the sampling system. To make this decision, perform the following steps.

Step	Action
1	If the decision has already been made to the leave the sampling system in place, no further action is necessary.
2	Using information developed in ESH-17-137, break out the PEDE of the source according to the following categories: 1. Active and ongoing potential. These include activities such as experimental work, decontamination and demolition, and facility activities that have the potential to emit radionuclides to the air. 2. Legacy potential. These include sources of emissions such as duct hold-up and facility off-gassing. Record this information, along with stack identifier, in Table 1 of Documentation Requirements for Tier III sources (Attachment 2).
3	Does the historical monitoring/sampling data account for a sufficient percentage of the emissions? Document in Table 2 of Attachment 2.

If …	then…
Legacy potential contributes ≥ 90% of the total emissions	The requirements for Tier III documentation have been met and the sampling system is not needed for Subpart H compliance. Go to the chapter *Deciding disposition of the sampling system*.
Legacy potential contributes < 90% of the total PEDE	Further evaluation is needed. Go to step 4.

Steps continued on next page.

Tier III sources, continued

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>4</td><td>Are other sources of documentation available that would meet the requirements for Tier III sources? Document in Table 3 of Attachment 2.
<table>
<tr><th>If …</th><th>then…</th></tr>
<tr><td>Sufficient secondary documentation exists to account for ≥ 90% of the total PEDE</td><td>The requirements for Tier III documentation have been met and the sampling system is not needed for Subpart H compliance. Go to the chapter Deciding disposition of the sampling system.</td></tr>
<tr><td>Sufficient secondary documentation does not exist to account for ≥ 90% of the total PEDE</td><td>Go to step 5.</td></tr>
</table></td></tr>
<tr><td>5</td><td>Can you develop other sources of documentation to meet the documentation requirements for Tier III sources? Document in Attachment 2.
<table>
<tr><th>If …</th><th>then…</th></tr>
<tr><td>Other information is available or can be made available that will satisfy the Tier III requirements for documentation for ≥ 90% of the PEDE</td><td>The requirements for Tier III documentation have been met and the sampling system is not needed for Subpart H compliance. Go to the chapter Deciding disposition of the sampling system.</td></tr>
<tr><td>Other information is NOT available or can NOT be made available that will satisfy the Tier III requirements for documentation for ≥ 90% of the PEDE</td><td>Treat the sample system as Tier II and follow the steps in the chapter for a Tier II source.</td></tr>
</table></td></tr>
</table>

Tier III sources, continued

Unsampled Tier III sources

If a source is Tier III and is not currently sampled, we must decide if the level of documentation associated with the emissions estimates meets the Tier III requirements. To make this decision, perform the following steps.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Using information developed in ESH-17-137, break out the PEDE of the source according to the following categories:
• Active and ongoing potential. These include activities such as experimental work, decontamination and demolition, and facility activities that have the potential to emit radionuclides to the air.
• Legacy potential. These include sources of emissions such as duct hold-up and facility off-gassing.

Record this information, along with stack identifier, in Table 1 of Attachment 2.</td></tr>
<tr><td>2</td><td>Does the historical monitoring/sampling data, account for a sufficient percentage of the emissions? Document in Table 2 of Attachment 2. If there is not historical sampling/monitoring data, go to step 3.
<table>
<tr><th>If …</th><th>then…</th></tr>
<tr><td>Legacy potential contributes ≥ 90% of the total emissions</td><td>The requirements for Tier III documentation have been met and a sampling system is not needed for Subpart H compliance. No further action is needed.</td></tr>
<tr><td>Legacy potential contributes < 90% of the total PEDE</td><td>Further evaluation is needed. Go to step 4.</td></tr>
</table>
b</td></tr>
<tr><td>3</td><td>Are other sources of documentation available that would meet the requirements for Tier III sources? Document in Attachment 2.
<table>
<tr><th>If …</th><th>then…</th></tr>
<tr><td>Sufficient secondary documentation exists to account for ≥ 90% of the total PEDE</td><td>The requirements for Tier III documentation have been met and a sampling system is not needed for Subpart H compliance. No further action is needed.</td></tr>
<tr><td>Sufficient secondary documentation does not exist to account for ≥ 90% of the total PEDE</td><td>Go to step 5.</td></tr>
</table></td></tr>
</table>

Tier III sources, continued

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>4</td><td>Can you develop other sources of documentation to meet the documentation requirements for Tier III sources? Document in Attachment 2.
<table>
<tr><th>If …</th><th>then…</th></tr>
<tr><td>Other information is available or can be made available that will satisfy the Tier III requirements for documentation for ≥ 90% of the PEDE</td><td>The requirements for Tier III documentation have been met and a sampling system is not needed for Subpart H compliance. No further action is needed.</td></tr>
<tr><td>Other information is NOT available or can NOT be made available that will satisfy the Tier III requirements for documentation for ≥ 90% of the PEDE</td><td>Treat the sample system as Tier II and follow the steps in this procedure for a Tier II source.</td></tr>
</table></td></tr>
</table>

Tier IV sources

Overview

ESH-17-RN establishes a graded approach to stack sampling and documentation requirements. Under this approach, any source with the potential to contribute less than 0.001 mrem/yr in any year. Per 40 CFR 61.93, these sources do not require continuous sampling.

Under the requirements of ESH-17-RN, documentation of estimated emissions are not required to be traceable to a secondary source of data (e.g., stack sampling).

Currently sampled Tier IV sources

If a source is Tier IV, there are no regulatory requirements to continue sampling the stack; however, before discontinuing any sampling system, proceed to the next chapter *Deciding disposition of the sampling system*.

Deciding disposition of a sampling system

Disposition of the system

If review of the previous considerations indicates that a source no longer requires a sampling system, and if the facility does not need to retain the sampling system, then the system can be disabled.

Steps for disabling a sampling system

To disable a sampling system, perform the following steps:

Step	Action
1	Send a memo to the facility's line management that states that calculations for current and future emissions indicate sampling for NESHAP is no longer required.
2	Request that the facility send a memo or email to ESH-17 that includes an agreement to terminate ESH-17 sampling.
3	Inform the Project Leader that the system is no longer needed.
4	The project leader, or designee, will then ensure that the sampling system is appropriately disabled and left in place.

Documenting your work

Required documents

Required documentation includes:

- all survey interviews and supporting data
- all forms from this procedure
- memos exchanged between ESH-17 and the operating group

Records resulting from this procedure

Records

The following records generated as a result of this procedure are to be submitted **within two weeks of completion** to the records coordinator:

- completed forms from this procedure
- all supporting calculations and documents
- all memos resulting from the performance of this procedure

Air Quality Group

Determining Sampler/Monitor Type

This form is from ESH-17-138

Stack number (ESIDNUM): _____ Tier: _____

Table 1. Ten Percent Radionuclides

Radionuclide	Percentage contribution	Type of sampler required
Total		

Table 2. Additional radionuclides if Table 1 total < 90%

Radionuclide	Percentage contribution	Type of sampler required
Total		

Table 1 total: _____ Table 2 total: _____

Sum of Table 1 and 2: _____ (Must be greater than 90%)

Table 3. Radionuclides not included in Table 1 or 2 that have PEDE >0.01 mrem/yr.

Radionuclide	Percentage contribution	Type of sampler required
Total		

Prepared by:

_____ _____ _____

Signature Name (print) Date

Reviewed by:

_____ _____ _____

Signature Name (print) Date

Project Leader approval by:

_____ _____ _____

Signature Name (print) Date

Air Quality Group

Documentation Requirements for Tier III sources

This form is from ESH-17-138

Stack number (ESIDNUM): _____ Tier: _____

Table 1. PEDE classification

Potential Cat.	Process Description	PEDE (mrem/yr)
Legacy Potential		
Active/ongoing		

Table 2. Percent of PEDE from Potential sourcs

Potential Cat.	Total PEDE	Percent of total
Legacy		
Active/ongoing		
Total		

Table 3. Additional Tier III documentation, if necessary

Process description	Tier III documentation	Available or can be created?	Percent of total PEDE
Legacy			
Total*			

*Total percent of total PEDE must be greater than 90%.
Is the total percent of PEDE (from Table 3) with Tier III documentation greater than 90%? Yes / No
If no, treat the source as a Tier II source.

Prepared by:

_____ _____ _____
Signature Name (print) Date

Reviewed by:

_____ _____ _____
Signature Name (print) Date

Project Leader approval by:

_____ _____ _____
Signature Name (print) Date